REMARKS

Claims 1 – 15 are presently pending. In the above-identified Office Action, Claims 1, 2, 4 and 10 – 14 were rejected under 35 U.S.C. § 102(b) as being anticipated by Campbell *et al.* ('323) hereinafter 'Campbell'. Claims 1 – 6 were rejected under 35 U.S.C. § 102(b) as being anticipated by Suzuki ('175). Claims 7 – 9 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Campbell in view of Abrams *et al.* ('268) hereinafter 'Abrams'.

By this Amendment, the Claims have been amended to more clearly define the patentably distinct features thereof. For the reasons set forth more fully below, the subject application is deemed to properly present claims patentable over the prior art. Reconsideration, allowance and passage to issue are respectfully requested.

As noted previously, the present invention addresses the need in the art for a system or method for improving phase conjugation fidelity in high power phase conjugate lasers and other electro-magnetic systems. In accordance with the invention, a novel spatial filter is taught. The inventive filter is adapted to increase the angular spread of non-conjugated energy in a beam and suppress this energy to improve the efficiency of the system without suppression of conjugated energy.

The invention is set forth in Claims of varying scope of which Claim 1 is illustrative. Claim 1 recites:

> 1. A spatial filter comprising:
> means for providing a nonconjugated beam of electromagnetic energy;
> **means for conjugating at least a portion of said beam of electromagnetic energy to provide a conjugated beam;**
> **means for increasing angular spread of said non-conjugated beam** and
> means for suppressing said angular spread non-conjugated beam without suppressing said conjugated beam. (Emphasis added.)

None of the references, taken alone or in combination, teach, disclose or suggest the invention as presently claimed. That is, none of the references teach, disclose or suggest a

spatial filter having means for suppressing a non-conjugated beam without suppressing an associated conjugated beam.

In the above-identified Office Action, the Examiner relied on Campbell, Suzuki and Abrams in the rejections of the Claims. Campbell purports to teach a local reference beam generator. The Examiner suggests that this reference teaches means for increasing angular spread non-conjugated energy and means for suppressing said spread non-conjugated energy. However, as noted previously, Campbell clearly does not teach means for suppressing the non-conjugated energy **without suppressing the conjugated energy thereof.**

In response to this argument, the Examiner suggested that Campbell's pinhole aperture could perform the function of suppressing non-conjugated energy. While this may be true in general, it is not true with respect to the language of the claims. Specifically, it is noted that Campbell provides no means for suppressing the non-conjugated energy **without** suppressing the conjugated energy thereof. Campbell endeavors to block the phase varying portion of a beam, not the non-conjugated portion thereof. See col. 6, lines 56 – 62.

Indeed, **Campbell does not disclose an arrangement for providing for conjugation of a non-conjugated beam** at all, let alone means for subsequently selectively suppressing the non-conjugated beam without suppressing the conjugated beam.

This mode of operation is advantageous inasmuch as it allows for a resonator design that offers improved phase conjugation fidelity relative to prior designs. The novel arrangement for effecting this advantageous mode of operation is disclosed in the subject Specification and set forth in the present claims. (See page 11, lines 14 – 25 and page 12, lines 3 – 17 of the present Specification by way of example.)

Nonetheless, the Claims have been amended to ensure that means for, or the step of, providing a conjugated beam are recited as limitations thereof.

Suzuki purports to teach opto-electric logic elements. The Examiner asserts Suzuki teaches means for increasing angular spread and means for suppressing. However, the teaching cited by the Examiner is not found in the reference. There are no reference numerals for an opaque plate 26 or first and second lenses 22 and 24 in Figures 1 and 2. Perhaps the Examiner is looking at the O'Meara reference. In any event, neither O'Meara

nor Suzuki teach, disclose or suggest means for suppressing the angularly spread non-conjugated energy without suppressing the **conjugated energy thereof** as presently claimed. If the Examiner is indeed referring to O'Meara ('176), it is noted that the laser gain medium ('12' in Fig. 1 and '112' in Fig. 2) is not an 'aberrator' as the term is used in the present Specification. As noted in the present Specification at page 11, line 26 through page 12, line 2:

> "The aberrator 86 ensures that the input beam is further distorted, increasing its étendue, before entering the PCM 50. As is known in the art, 'étendue' is a product of beam size and beam divergence. As such, étendue is a measure of beam quality. High étendue translates to poor beam quality. High étendue means the beam divergence is high for a given beam size. In the best mode, the aberrator 86 is chosen to increase the divergence of the incident beam to some value $\theta_A \approx (2 \text{ to } 3)\cdot\theta$, assuming no magnification in telescope 80."

As is well-known in the art, laser gain media are designed to output a collimated beam of energy, not aberrate (i.e., increase the angular spread) of a beam of energy passing therethrough. Hence, the invention of Claims 1 – 6 is not taught by Suzuki ('175) or O'Meara ('176). Accordingly, this ground of rejection should be withdrawn as well.

Abrams was cited for its teaching of a conjugate amplifier. However, Abrams also does not teach, disclose or suggest means for suppressing the angularly spread non-conjugated energy without suppressing the **conjugated energy thereof** as presently claimed.

Hence, the present Claims should be allowable. Reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
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